

justified as to direction, one hundred and ten. Of the signals ordered, one hundred and eight were cautionary, of which eighty-two were wholly and six partly justified; eight were storm signals, of which five were wholly and two partly justified. Fifty-eight signals were ordered for easterly winds, of which fifty-seven were justified; fifty-eight were ordered for westerly winds, of which fifty-three were justified. Percentage of justifications, 78.6.

No cold-wave signals were ordered during the month.

CAUTIONARY SIGNALS FOR JUNE, 1889.

Statement showing percentages of justifications of wind signals for the month of June, 1889:

Wind signals.—(Ordered by Assistant Professor H. A. Hazen.) Total number of signals ordered, forty-four; justified as to velocity, wholly, twenty-four, partly, two; justified as to direction, forty-three. All of the signals ordered were caution-

ary. Twenty-three of the signals were ordered for easterly winds, of which twenty-two were justified, and twenty-one were ordered for westerly winds, of which all were justified. Percentage of justifications, 57.1.

Percentages of local verifications of weather and temperature signals as reported by directors of the various State Weather Services for June, 1889.

States.	Weather.	Temperature.	States.	Weather.	Temperature.
Illinois.....	80.6	85.2	New Jersey.....	60.1	86.6
Kansas.....	83.4	85.7	New York.....	79.0	88.0
Kentucky.....	84.0	90.0	North Carolina.....	78.9	73.9
Michigan.....	85.7	83.1	Ohio.....	82.0	85.0
Minnesota.....	64.0	75.0	Pennsylvania.....	76.0	88.0
Nebraska.....	83.6	91.3	South Carolina.....	85.5	87.0

STATE WEATHER SERVICES.

[Temperature in degrees Fahrenheit; precipitation, including melted snow, in inches and hundredths.]

The following extracts are republished from reports for June, 1889, of the directors of the various state weather services:

ALABAMA.

The average temperature for the month was 2.5 below the normal. This unusual depression was caused by the remarkably cool season the first few days of June. The thermometer ranged so low that some of the observers in the northern portions of the state reported the occurrence of slight frost.

The precipitation was slightly above the average, 0.29. Rains were frequent in north and west Alabama, while in eastern and southern portions of the state the farms suffered for rain until near the close of the month, when copious showers fell. Nearly one half the month was cloudy and there were few really bright, clear days.

SUMMARY.

Temperature.—Monthly mean, 75.7; highest monthly mean, 85, at Union Springs; lowest monthly mean, 70.2, at Valley Head; maximum, 101, at Wiggins, 18th; minimum, 36, at Valley Head, 1st; range for state, 65; greatest local monthly range, 53, at Wiggins; least local monthly range, 30, at Union Springs.

Precipitation.—Average for the state, 4.82; greatest, 8.91, at Elkmont; least, 1.06, at Citronelle.

Wind.—Prevailing direction, south.—*P. H. Mell, Signal Corps, Auburn, director.*

ARKANSAS.

SUMMARY.

Temperature.—Monthly mean, 74.1; highest monthly mean, 77.4, at Texarkana; lowest monthly mean, 69.8, at Dallas; maximum, 100, at Lead Hill, 19th and 20th; minimum, 42, at Paris, Tex., 1st; range for state, 58; greatest local monthly range, 52, at Paris, Tex.; least local monthly range, 28, at Marshall.

Precipitation.—Average for the state, 5.21; greatest, 9.48; least, 1.54, at Brinkley.—*Prof. John C. Branner, Little Rock, director; W. U. Simons, Sergeant, Signal Corps, assistant.*

COLORADO.

SUMMARY.

Temperature.—Monthly mean, 63.0; highest monthly mean, 71.5, at Mag-nolia; lowest monthly mean, 44.2, at Climax; maximum, 98.0, at Rocky Ford, 25th and 28th; minimum, 8.0, at Breckenridge, 10th; range for state, 90.0.

Precipitation.—Average for the state, 1.76; greatest, 5.10, at Cheyenne Wells; least, 0.14, at T. S. Ranch.—*Prof. F. H. Loud, Colorado Springs, director; T. W. Sherwood, Sergeant, Signal Corps, assistant.*

ILLINOIS.

SUMMARY.

Temperature.—Monthly mean, 67.2; maximum, 97, at Belvidere, 28th; minimum, 36, at Lake Forest, 1st; range for state, 61; mean of maximum, 90.6; mean of minimum, 44.4.

Precipitation.—Average for the state, 5.52; greatest monthly, 11.49, at Flora; least monthly, 1.50, at Sycamore.

Wind.—Prevailing direction, southwest.—*John Craig, Sergeant, Signal Corps, Springfield, in charge.*

INDIANA.

The month was cool; the mean temperature is the lowest for more than eighteen years, and it is about 5 below the normal for that period. The maximum occurred nearly everywhere on the 20th or 30th, and the lowest on the 1st.

The average precipitation is slightly above the normal, but the amounts were evenly distributed. All over the state rains were quite frequent, in fact to such an extent as to interfere with farm work.

SUMMARY.

Temperature.—Monthly mean, 67.9; highest monthly mean, 71.9, at Maringo; lowest monthly mean, 63.9, at Columbia City; maximum, 95, at Can-nelton, 20th; minimum, 39, at Mauzy, 1st; range for state, 56; greatest local monthly range, 54, at Mauzy; least local monthly range, 38 at Butlerville.

Precipitation.—Average for the state, 4.12; greatest, 7.32, at Delphi; least, 2.60, at Marion.

Wind.—Prevailing direction, southwest.—*Prof. H. A. Huston, La Fayette, director; C. F. R. Wappenhans, Sergeant, Signal Corps, assistant.*

IOWA WEATHER CROP BULLETIN SERVICE.

Both temperature and rainfall during the month were below the normal. The cool weather that prevailed during the first part of the month was succeeded by warmer weather, which, with the assistance of frequent and well-distributed showers, has advanced all crops to the standard for this time of the year. Frost occurred in some parts of the state on the 1st, causing considerable damage to tender vegetables, and retarding the growth of corn, but the high temperature during the latter part of the month has caused corn to recover rapidly, and it is now in splendid condition.

SUMMARY.

Temperature.—Monthly mean, 67.7; highest monthly mean, 72.6, at Wash-ington; lowest monthly mean, 64.0, at Cresco; maximum, 98, at Logan, 29th, and at Washington, 30th; minimum, 33, at Wesley, 1st; greatest local monthly range, 62, at Logan; least local monthly range, 25, at Gillet; range for state, 65.

Precipitation.—Average for the state, 4.68; greatest monthly, 9.87, at Logan; least monthly, 1.69, at Bancroft.—*G. M. Chappel, Sergeant, Signal Corps, Des Moines, in charge, Iowa Weather Crop Bulletin Service.*

KANSAS.

SUMMARY.

Temperature.—The mean temperature for the state is 71.2. In the eastern division 71.4, in the central 72.3, and in the western 70. There is a deficiency in temperature, amounting to 3 and upward, in the eastern division, but, diminishing westward, it falls slightly below 3 in the western division. Three cool waves passed over the state during June, centering about the 1st, 11th, and 22d. The range of temperature for the state is 67, being 3 greater than for June, 1887 and 1888. The maximum temperature, 107, is 2 less than June, 1887, and 13 higher than that of June, 1888.

Precipitation.—The average rainfall for the state, 4.01, is 0.05 greater than that of June, 1888, and 0.43 greater than that for June, 1887. The average rainfall in the western division for June, 1887, was 2.47; for 1888, 2.04; and for 1889, 3.35. In the middle division it was 3.59 in 1887, 3.04 in 1888, and 3.90 in 1889. In the eastern division, for June, 1887, it was 4.69; 1888, 5.44; while for 1889 it has dropped to 4.78. As regards the divisions of the state, the rainfall this year has been much more equable, but in each division the range is great. In the eastern division it ranges from 2.00 in the northeastern counties to 9.00 in Bourbon. In the central from less than 2.00 in Republic, Russell, and Rush to 5.00 and over in Mitchell, Osborne, Rooks, and Ellis, and 7.00 and over from Reno eastward. In the western from less than 1.00 in the southern parts of Trego and Gove to over 4.00 in Haskell, 5.00 in Gree-ley, and 10.00 in Rawlins. The rainfall is deficient from the Missouri River to Mitchell, and from the north line south to Franklin, Coffey, Lyon, and Chase; in Cherokee, Labette, Montgomery, and Chautauqua; and in Meade, Clark, Kiowa, and Pratt; and thence north to Russell, Ellis, Graham, and Sheridan. There is an excess from the southeast part of Reno to the east line of the state, being greatest in Bourbon. An excess occurs in the western and northwestern counties, culminating in Rawlins. A severe hail-storm

occurred on the night of the 7th and 8th in many of the northern counties; in Decatur the hail-stones measured from one to three inches in diameter. In Bourbon, on the 15th, from 9 to 11 a. m., 2.40 of rain fell; the following night 0.60 fell, and on the 16th, from 7 to 9 a. m., 3.70 more fell, making a total of 6.60 in twenty-four consecutive hours. This excessive rainfall caused much damage along the Marmaton River. At the same time a very heavy downpour occurred in the southern parts of Chase and Marion, and northern part of Butler, rapidly raising the Walnut, and doing much damage along its course. In Rooks, near Stockton, on the 8th, 3.00 fell, 2.00 of which fell in an hour and a half.

Wind.—Prevailing direction, south.—*Prof. J. T. Lovewell, Topeka, director; T. B. Jennings, Sergeant, Signal Corps, assistant.*

KENTUCKY.

SUMMARY.

Temperature.—The average temperature for the month, as deduced from the tri-daily observations, was 69.5; from the average of the mean maximum and mean minimum temperature, 70.6. These figures indicate a deficiency of about 5 less than the normal. The highest temperature recorded during the month was 99, at McHenry, 20th, and the lowest 38, at Pellville, 1st. The latter day was the coolest of the month. The warmest days were the 20th, 21st, 29th, and 30th. The mean monthly range of temperature was 46.2; the greatest range 56, at Pellville, and the least, 35, at Millersburg. The month was characterized by a great uniformity in temperature, no excessive daily ranges being recorded.

Precipitation.—The average precipitation for the state was 5.27, which is a little less than 1.00 in excess of the normal. The largest monthly rainfall, 8.19, was recorded at Shelbyville, and the smallest, 1.88, at South Fork. The number of days upon which rain fell was excessive, the average for the month being 13. At Louisville rain fell each day during the period embraced between the 7th and the 21st. Despite the abnormally great amount of precipitation during the past six weeks, there still remained at the central station on June 30th a deficiency of 7.74 since January 1st. This shortage approximates that of the state, it being more marked, however, in the eastern counties.

Wind.—Prevailing direction, southwest.—*Dr. E. A. Grant, Louisville, director; Frank Burke, Sergeant, Signal Corps, assistant.*

LOUISIANA.

The drought of several months duration was effectually broken by heavy rain during the month. From April 1st to June 9th the rains were very light and unevenly distributed, but since the latter date there has been enough, if not too much, to be of greatest benefit to the cane, cotton, and corn. The thermal conditions averaged from 2 to 3 below the normal, and the low temperature of the early part of the month is without parallel in the record for southern Louisiana, 50 and below having been reported at five stations in south-central Louisiana, on the 1st. The rainfall in the northern section averaged an excess of 4.31 for the month; in the southern section the excess was but 1.68.

SUMMARY.

Temperature.—Monthly mean, 77.8; highest monthly mean, 83.5, at Cameron; lowest monthly mean, 74.4, at Cheneyville; maximum, 101, at Cameron, 16th and 19th; minimum, 42, at Cheneyville, 1st; range for state, 59; greatest local monthly range, 50, at Saint Joseph and Cheneyville; least local monthly range, 28, at Port Eads, Abbeville, and Shell Beach; mean daily range, 19.4.

Precipitation.—Average for the state, 7.77; for the northern section, 8.04; southern section, 7.60; greatest local monthly rainfall, 15.51, at Crowley; least local monthly rainfall, 3.43, at Cameron; greatest daily rainfall, 5.90, at Cheneyville, 10th.

Wind.—Prevailing direction, south.—*R. E. Kerkam, Sergeant, Signal Corps, New Orleans, in charge.*

MICHIGAN.

The temperature for the month has been below the normal, and this June is the coldest of any on the records of this service. The rainfall has been abundant and the ground is well saturated with moisture, the rainfall being above the average in the lower peninsula.

SUMMARY.

Temperature.—The mean temperature for the month, 60.9, is 5.1 below the normal of fourteen years. The temperature was below the normal in all sections, ranging from 3 in the upper peninsula to 5 in the southern section. The temperature was above the normal on the 16th, 19th, 29th, and 30th; normal on the 14th and 20th, and below on the remaining days. The highest mean daily temperature, 75, occurred on the 30th, when the temperature was 5 above the normal, and the lowest, 45, occurred on the 1st, when the temperature was 16 below the normal. The highest mean daily temperature in the past fourteen Junes, 81, occurred on the 30th, 1878, and the lowest, 45, on the 1st, 1889. The highest mean monthly temperature, 69.5, occurred in 1876, and the lowest, 60.9, occurred in 1889. The maximum temperature for the month, 94, occurred on the 30th, at Evart, and the minimum, 29, on the 1st, at East Tawas. Light frosts were reported at the following stations: 4th, Noble; 6th, Bellaire, Ivan, and Noble; 22d, Fremont; 23d, Bear Lake, Ivan, Lansing, and Roscommon.

Precipitation.—The average rainfall for the month of June, 4.25, is 0.37 above the average of the past thirteen Junes. The rainfall was above the average in the southern peninsula, and below in the upper peninsula. The largest average above the normal, 0.59, occurred in the northern section. The

largest amount of rainfall recorded at any one station, 7.86, occurred at Saint Ignace, and the least, 1.24, at Berlin, Saint Clair Co. Rain was recorded in some portion of the state on every day of the month except the 23d, 24th, and 25th. The heaviest rainfall was recorded on the 1st in the upper peninsula, on the 9th in the northern section, on the 15th in the central section, and on the 16th in the southern section.

Wind.—Prevailing directions, southwest.—*N. B. Conger, Sergeant, Signal Corps, Lansing, director.*

MINNESOTA.

SUMMARY.

Temperature.—Monthly mean, 63.8; highest monthly mean, 65.9, at Saint Vincent and Farmington; lowest monthly mean, 57.8, at Duluth; maximum, 99, at Brainard, 29th; minimum, 30, at Pokegama Falls, 22d; range for state, 69; greatest local monthly range, 62, at Pokegama Falls; least local monthly range, 37, at Duluth; greatest daily range, 48, at Saint Vincent, 3d; least daily range, 3, at Morris, 24th.

Precipitation.—Average for the state, 2.41; greatest, 4.53, at Morris; least, 0.76, at Saint Vincent.

Wind.—Prevailing direction, south. By sections, southerly in the north, and northwest in the south half of the state.—*John Healy, Private, Signal Corps, Saint Paul, in charge.*

MISSISSIPPI.

SUMMARY.

Temperature.—The month was remarkable for the lowest mean temperature recorded in the state for June. The normal was 79.1, and the monthly mean for the state 75.8. The mean temperature gradually rose from 64, on the 1st, to 78, on the 8th; then occurred a fall to 70 in the northern and central parts, on the 12th; a rise followed culminating at 81, between the 17th and 19th. Slight fluctuations above and below 75 continued to the end of the month. The mean temperature was below the normal on twenty-four days. The daily range was about 30 on the 1st, and 5 on the 13th; on the other days its value was usually between 14 and 22. The extreme monthly ranges in the state were 36, at Corinth, 1st, and 104, at Columbus, 17th. The ranges, both diurnal and monthly, were greatest at stations on the eastern side of the state.

Precipitation.—The average number of days on which rain fell was ten, and the average rainfall 6.54, being 2.29 above the normal. The deficiency since January has thus been reduced to 9.41.—*R. B. Fulton, Signal Corps, University, director.*

MISSOURI.

SUMMARY.

Temperature.—The mean temperature for June was 70.4. The highest temperature reported was 100, at Protom, and the lowest, 38, at Steelville. The average of maximum temperatures was 92.6, and the average minimum temperatures 47.5, making an average range of 45.1. The highest temperatures occurred on the 19th, 20th, 28th, 29th, and the lowest on 1st, 9th, 10th.

Precipitation.—The average precipitation, 4.58, is 0.38 below the June normal. The greatest amount of precipitation reported was, 8.80, at Oak Ridge, and the least, 2.48, at Conception and Kirksville. In the state as a whole precipitation occurred on 21 days. The greatest number of days of precipitation in any one place was sixteen days at Cairo, Ill., and the least, 5, at Oak Ridge.—*Prof. Francis E. Nipher, Saint Louis, director; W. H. Hammon, Sergeant, Signal Corps, assistant.*

NEBRASKA.

The mean temperature for the month is slightly below the normal, with but few extremely hot days. The precipitation is above the normal and has been most abundant in those parts of the state which in May had a deficiency.

SUMMARY.

Temperature.—The mean temperature for southeastern Nebraska, 69.0, and the maximum for the state, 104, have not been exceeded in previous years. A slight frost on the 4th was reported at Hay Springs.

Precipitation.—The range of precipitation was exceedingly large, varying from less than 1.00 at Fairbury to over 9.00 at West Point. Last month the maximum precipitation in the state, 7.00, was recorded at Fairbury, and the Elkhorn Valley had nearly the least. The average for the state was nearly 4.00, which is over 1.00 above the normal for June. The number of rainy days has also been large. This makes the prospect for the corn good, although it has been a long time since the ground was thoroughly soaked, and the crops will be dependent upon the due amount of precipitation in July and August.—*Prof. Goodwin D. Swezey, Crete, director; G. A. Loveland, Corporal, Signal Corps, assistant.*

NEVADA.

SUMMARY.

Temperature.—The month was attended with fine, clear, pleasant but rather dry weather, particularly in the central and southern counties. There were no general storms during the month, the only atmospheric disturbances being in the shape of thunder and hail-storms in different parts of the state. The mean temperature for the state, 70.0, was slightly above the normal for this month. There were two very warm periods, from the 24th to 26th, and from the 29th to the 30th. The highest temperature for the state, 110.0, was observed at El Dorado Canyon, 30th. Between these two warm periods there was a cold one, from the 27th to the 28th. The lowest temperature reported was 30.5, at Tuscarora, 2d, making the absolute range for the state 79.5.

Precipitation.—The average for the state for this month indicates a deficiency of 0.10. The rainfall was heaviest in Elko and Douglas counties, and the least in Lincoln county. The effect of the drought is again being felt in all sections; farmers and millmen still complain of the scarcity of water in the streams, which are lower now than for several years past.—*Prof. Chas. W. Friend, Carson City, director; H. F. Alciatore, Private, Signal Corps, assistant.*

NEW ENGLAND METEOROLOGICAL SOCIETY.

June was warm and the amount of rain was not far from the average, being slightly above the normal. The mean temperature exceeded the normal by about 1; the individual readings exceeded 90 near the close of the month, but the 18th and 19th were two very cool days associated with the passage of an anti-cyclonic area. Light frosts were reported in some localities on these dates. There were no excessive rains, but the northern states received more rain than the southern. Local rains were very frequent, and on two days only was no rain reported from some station.

SUMMARY.

Temperature.—Monthly mean, 65.4 (103 stations); highest monthly mean, 71.0, at Birmingham; lowest monthly mean, 55.7, at Eastport; maximum, 98, at Birmingham, 29th; minimum, 28, at Berlin Falls, 28th; range for New England, 70; greatest local monthly range, 62, at Berlin Falls and Stratford; least local monthly range, 29, at Nantucket and Block Island; greatest daily range, 50, at Berlin Falls, 1st; least daily range, 1, at Stratford, 5th.

The average temperature for June for 25 stations, having records for more than ten years, is 65.2; the average for June, 1889, is 66.2, departure, +1.0.

Precipitation.—Average for New England, 3.70 (136 stations); greatest, 8.42, at Manchester, Vt.; least, 1.39, at Brewster.

Wind.—Prevailing direction, southwest.—*Prof. William H. Niles, Boston, Mass., president; Prof. Winslow Upton, Providence, R. I., secretary; L. G. Schultz, Sergeant, Signal Corps, assistant.*

NEW JERSEY.

SUMMARY.

Temperature.—The mean temperature for the month, 69.9, is 1.6 above the average for the month, and 0.9 below the average for the corresponding month of 1888. Highest monthly mean, 74.9, at Readington; lowest monthly mean, 66.0, at Atlantic City; maximum, 92, at Billingsport, 17th and 21st; minimum, 37, at Freehold, 4th; range for state, 55; greatest local monthly range, 51, at Freehold and Gillette; least local monthly range, 30, at Bridgeton and Readington; greatest daily range, 41, at Tenafly, 7th; least daily range, 2, at Newark, Brunswick, and Paterson, 1st and 12th.

Precipitation.—The average for the state, 3.73, is 0.25 below the average for the month, and 1.14 above the average for the corresponding month of 1888; greatest, 6.75, at Lambertville; least, 2.39, at Tenafly.

Wind.—Prevailing direction, southwest.—*Prof. George H. Cook, New Brunswick, director; E. W. McGann, Sergeant, Signal Corps, assistant.*

NEW YORK.

SUMMARY.

Temperature.—The highest temperature, 96, at Utica, 29th, and the lowest, 39, at Middleburgh, 7th. The mean temperature for the state was 63.9; the 30th being the hottest, and the 6th the coldest day. The greatest local range of temperature, 66, at Utica, and the least, 26, at Queensbury; range for the state, 67. The temperature was generally below the normal except at New York City, where it was 0.3; Setauket, 2.3, and White Plains, 0.1 above.

Precipitation.—The average precipitation for the state was 6.70. The rainfall was generally above the average, except at Ardenia, where it was 0.04; New York City, 1.04, and Setauket, 1.07 below. The greatest monthly rainfall was 12.31, at Hess Road Station, and the least was 2.38, at New York City. Average number of rainy days, 14.

Wind.—Prevailing direction, southwest.—*Prof. E. A. Fuytes, Ithaca, director; I. W. Brewer, Private, Signal Corps, assistant.*

NORTH CAROLINA.

SUMMARY.

Temperature.—Monthly mean, 72.4; highest monthly mean, 79.6, at Southern Pines; lowest monthly mean, 67.2, at Asheville, 1st; maximum, 98, at Southern Pines, 15th; minimum, 37, at Asheville, 1st; monthly range for the state, 61; mean daily range of temperature, 16.4; highest mean daily range, 21.5, at Asheville; lowest mean daily range, 8.0, at Hatteras.

Precipitation.—Average for the state, 6.57; greatest monthly, 11.91, at Hatteras; least monthly, 3.90, at Southern Pines.

Wind.—Prevailing direction, southwest.—*Dr. Herbert B. Battle, Raleigh, director; H. McP. Baldwin, Private, Signal Corps, assistant.*

OHIO.

SUMMARY.

Temperature.—The mean temperature, 66.7, was 2.3 below the average for June. The mean temperature of the northern section was 65.2; of the middle section, 66.6; and of the southern section, 68.4. These means are 2.4, 2.2, and 2.2 below the averages for the sections for June.

The maximum temperature, 92.2, occurred at Georgetown, 29th. This is the lowest maximum temperature for June since 1883. The minimum temperature, 38, occurred at Wapakoneta, Wooster, and Bangorville, 1st, and at Wauseon, 4th. The mean daily range of temperature was 18.6. The greatest daily range being 39.5, at Logan, 9th; the smallest, 4.5, at Westerville, 1st.

Precipitation.—Precipitation was general in all sections on the 4th, 8th,

14th to 19th, 25th to 29th; in the northern and middle sections on the 1st, and in the southern section on the 10th and 11th. Local rains occurred in all sections on the 7th, 9th, 21st, and 30th; in the southern section on the 1st, and in the northern section on the 11th. The following unusually heavy rainfalls were reported: 1.33 in 30 minutes, at Hiram, 27th; 1.92 in 1 hour, at Akron, 28th; and 1.05 in 1 hour and 45 minutes, at Wooster, 30th. The heaviest rainfall in twenty-four hours was 2.54, at Ashland, 30th. Thunderstorms were general in all sections on the 7th, 8th, 9th, 14th, 15th, 16th, 18th, 27th to 30th. The mean rainfall in the northern section was 4.19; in the middle section, 3.79; and in the southern section, 4.42. These means are 0.54, 0.13, and 0.47 above the means for the sections. The mean for the state, 4.13, is 0.38 above the average for June. The deficiency in rainfall for the year to July 1st amounts to 1.12 in the northern section; 4.82 in the middle section; and 6.50 in the southern section. The average deficiency for the state amounts to 4.14.

Wind.—Prevailing direction, southwest.—*Prof. B. F. Thomas, Columbus, director; Lieut. Charles E. Kilbourne, secretary; C. M. Strong, Corporal, Signal Corps, assistant.*

PENNSYLVANIA.

SUMMARY.

Temperature.—The mean temperature for the month of June, 1889, was 66.5, which is from 2.0 to 3.0 below the average, and 2.0 below the corresponding month of last year. The means of the maximum and minimum temperatures were 76.4 and 75.0, respectively. Neither extreme high nor low temperatures were noted during the month. The warmest period at most stations was on the 21st, and the coldest on the 2d, 7th, and 24th. Frost occurred in some of the northern border counties on these dates. The highest recorded temperatures were Reading, 95; Carlisle, 93; Pottstown, 91, and York, 91. The lowest were Dyberry, 33; Honesdale, 35, and State College 37.

Precipitation.—The average rainfall for June, 1889, was 5.43, which is an excess of 1.63. The entire month was characterized by frequent and heavy rainfalls. The great and destructive rain-storm of the 30th and 31st of May continued to the morning of June 1st over a great extent of country. On the last-named date, over twenty stations report a fall of from 1.00 to 3.00, making a total for the three days' storm, as follows: Wellsborough, 9.80; McConnellsburch, 8.99; Grampian Hills, 8.60; Harrisburg, 7.78; Selin's Grove, 7.53; Charlesville, 7.60; Huntingdon, 6.57; Coudersport, 6.38; Philipsburgh, 6.09; Smethport, 6.00; New Bloomfield, 6.14; Emporium, 5.97; Hollidaysburgh, 5.80; Eagle's Mere, 5.53; Altoona, 5.33; Girardville, 4.59; Somerset, 4.43; Myerstown, 3.37. For the month of June one station had rain on 21 days, four stations on 20 days, one station on 19 days, and three stations on 18 days. The average for the state was 15 days. The following stations report the greatest total: Wellsborough, 10.04; Myerstown, 8.66; Reading, 8.21; Girardville, 8.01; Scisholtzville, 7.91; Ottsville, 7.58; Smith's Corner, 7.54; Uniontown, 7.36; Quakertown, 7.13, and Harrisburg, 7.18. The excessive rainfall, and the unusual number of rainy days, marks the month as exceptionally wet. With the exception of the 2d, 23d, and 24th, rain fell on every day in some part of the state.

Wind.—Prevailing directions, west and southwest.—*Under direction of the Franklin Institute, Philadelphia; T. F. Townsend, Sergeant, Signal Corps, assistant, in charge.*

SOUTH CAROLINA.

SUMMARY.

Temperature.—Monthly mean, 74.4; normal for the past three years, 76.8; departure, -2.4; highest monthly mean, 78.0, at Blackville; lowest monthly mean, 68.5, at Conway; maximum, 99.0, at Chester, 18th and 21st, at Jacksborough, 19th and 20th, and at Winnsborough, 21st; minimum, 39.0, at Evergreen; range for state, 60.0. In most instances the highest maximum occurred on the 19th and the minimum on the 1st.

Precipitation.—Mean depth for the state, 5.10; average for the past three years, 3.79; departure, +1.31; greatest monthly, 7.84, at Winnsborough; least monthly, 2.29, at Branchville; greatest daily, 2.61, at Timmons ville, 29th; average number of rainy days, 10.3.

Wind.—Prevailing direction, southeast.—*Hon. A. P. Butler, Columbia, director; H. C. Seymour, Private, Signal Corps, assistant.*

TENNESSEE.

The month of June was almost a phenomenal one as regards rainfall and electrical disturbances, although no very severe storms were reported. The month opened with a cold wave, resulting in a light frost in various portions of the state. The percentage of cloudiness was in excess of the normal; this feature, and the continuous rainfall from the 9th to the 21st, inclusive, made it a very unfavorable month for farming operations.

SUMMARY.

Temperature.—Mean temperature, 71.5, is the lowest, together with that of 1886, during the seven years past; highest local monthly mean, 75.9, at Woodstock; lowest local monthly mean, 66.8, at Greeneville; maximum, 95, at Woodstock, 20th; minimum, 37, at Nunnely, 1st; this was the lowest June minimum during the past seven years, except that of last year, which was 36. The highest temperature was generally recorded on the 10th and 18th in the eastern division, about the 29th and 30th in the middle division, and on the 19th and 20th in the western division. The lowest temperature was recorded throughout the state on the 1st. The daily ranges of temperature were generally less than the normal.

Precipitation.—The average amount of rainfall during the month was 5.63,

which is the greatest June average during the past seven years, except in 1886, when it was 7.24. Of this amount the eastern division received an average of about 6.60, the middle division a little more than 3.75, while the western division received nearly 7.50. The rains were well distributed and fell on twenty-six days in various portions of the state, the 6th, 7th, 23d, and 24th being noted without measurable rain. With a few exceptions there were no heavy rains, the greatest local daily rainfall being at Memphis, 3.98, on the 13th.

Wind.—Prevailing direction, southwest.—J. D. Plunket, M. D., Nashville, director; H. C. Bate, Signal Corps, assistant.

TEXAS.

SUMMARY.

Temperature.—The mean temperature for June over the state was 77.5, which is 8 below the normal for the month for fifteen years. The greatest departure from the normal was over the central portion of the state, where the deficiency was 6, and least in the Panhandle where the deficiency was about 2. The highest temperature reported was 104 at Rio Grande City, 8th; El Paso, 20th, and Pecos City, 22d, and the lowest, 52, at Pecos City, 30th.

Precipitation.—The rainfall for June was in excess over the entire state, but the greatest departure was over that section north of the thirtieth parallel and east of the one hundredth meridian (west from Greenwich) which includes all the agricultural portion of the state. Over this section the amount which fell during the month ranged from 6.00 to 12.00, and averaged 8.45, which is over one hundred per cent. above the normal for the month. The precipitation during this month was thirty-three and one-third per cent. greater than the rainfall in June for any year from and including 1876 to the present date (a period of fourteen years). The lowest which has fallen over this section in June during the same period was 0.50 of an inch in 1881.—S. O. Young, M. D., Galveston, director; I. M. Cline, Sergeant, Signal Corps, assistant.

Meteorological record of Army post surgeons, voluntary, and other co-operating observers, June, 1889.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean.			Max.	Min.	Mean.	
<i>Alabama.</i>	0	0	0	<i>Ins.</i>	<i>Arizona—Cont'd.</i>	0	0	0	<i>Ins.</i>
Auburn	92	46	76.1	2.71	Tombstone	98	54	77.4	0.30
Birmingham	92	26	70.6	1.34	Tucson (1)*	102	50	73.5	0.05
Butler	95	43	77.8	3.23	Tucson (2)*	102	50	73.5	0.05
Centre	87	50	74.5	8.82	Volunteer Springs	92	28	59.5	0.72
Citronelle	100	46	79.4	1.06	Walnut Grove	98	65	80.6	0.07
Columbiana	93	60	75.4	6.20	Wilcox	98	65	80.6	0.07
Decatur (1)†	94	38	75.1	3.12	Williams	91	32	61.4	T.
Decatur (2)†	94	38	75.1	3.35	Willow Springs	105	76	89.3	0.00
Elkmount	96	48	73.1	8.91	<i>Arkansas.</i>				
Eufaula	94	46	76.8	3.14	Arkansas City†	94	50	73.1	1.54
Evergreen†	97	44	77.7	6.24	Brinkley†	94	50	73.1	1.54
Fayette C. H.†	90	39	74.4	7.50	Camden†	89	57	73.1	9.48
Florence	86	45	70.5	4.35	Conway	90	50	69.8	4.60
Fort Deposit†	96	45	77.4	3.31	Dallas†	90	50	69.8	4.60
Greensborough†	94	46	76.9	3.37	Dardanelle†	90	50	69.8	4.60
Livingston (1)†	92	45	75.6	6.42	Dayton†	89	56	73.3	2.76
Livingston (2)†	94	42	76.1	4.62	Devall's Bluff†	96	48	75.5	4.90
Luverne†	94	45	78.2	2.11	El Dorado†	87	47	72.4	7.25
Marion†	94	38	74.6	4.63	Eureka Springs	95	50	73.1	8.90
Mostest	92	41	75.0	5.93	Forrest City†	95	50	75.0	6.53
Mt. Vernon B'ks.	97	48	77.7	1.98	Fulton†	95	50	75.0	6.53
New Market†	86	38	72.0	5.49	Heber	94	44	71.7	2.76
Opelika†	96	44	77.0	4.34	Helena (1)†	94	46	74.5	3.83
Pine Apple†	98	40	77.8	0.69	Helena (2)†	94	46	74.5	3.83
Selma†	96	43	79.1	4.75	Lead Hill	100	50	74.9	4.70
Talladega	93	42	74.1	7.52	Little Rock B'ks.	91	51	73.6	3.06
Tuscaloosa	89	43	78.5	5.36	Lonoke	94	53	75.2	5.75
Tuscumbia (1)	89	50	72.8	6.04	Malvern†	95	54	76.6	2.07
Tuscumbia (2)†	90	36	70.3	5.45	Marshall†	88	60	74.6	4.80
Union Springs	96	66	85.0	3.42	Monticello†	94	48	77.0	3.30
Uniontown	95	44	78.7	3.57	Newport (1)†	94	48	77.0	3.30
Valley Head†	88	36	70.2	5.05	Newport (2)†	96	46	73.8	3.75
Wiggins d.	101	48	78.6	4.04	Ozone†	91	45	70.4	6.20
<i>Alaska.</i>					Ozone†	86	54	70.9	4.05
Killisnoo	74	38	53.7	1.85	Pine Bluff†	94	50	76.8	4.99
<i>Arizona.</i>					Prescott†	88	59	74.8	5.49
Antelope Valley	0	0	0	0.00	Russellville†	94	52	74.6	6.40
Ash Canyon	0	0	0	0.26	Stuttgart†	93	49	73.4	8.35
Benson	100	74	85.0	0.63	Texarkana†	94	50	77.4	6.28
Casa Grande	112	70	89.6	0.00	Washington†	89	47	74.0	6.32
Cedar Springs	0	0	0	0.47	<i>British Columbia.</i>				
Curtis	0	0	0	0.04	New Westminster	84	46	62.0	1.93
Flagstaff	100	30	64.3	0.30	<i>California.</i>				
Florence	109	57	83.2	0.00	Alcade	105	65	84.2	0.00
Fort Apache	98	42	70.3	0.10	Alcatraz Island	69	50	57.4	T.
Fort Bowie	94	56	77.4	0.04	Almaden	90	58	70.0	0.00
Fort Huachuca	95	51	74.6	0.16	American Hill†	93	52	71.4	0.40
Fort Lowell	108	52	81.2	0.45	Anaheim	86	60	69.4	0.00
Fort McDowell	113	54	85.2	0.06	Anderson†	104	60	82.7	1.73
Fort Mojave	113	64	87.8	T.	Angel Island	87	51	62.2	0.06
Fort Verde	104	50	75.7	T.	Antioch	91	53	73.9	T.
Globe	99	42	73.0	0.38	Aptos	85	55	62.5	0.00
Holbrook	99	42	73.0	0.20	Athlone	93	55	72.7	0.20
Maricopa	106	75	88.8	0.00	Auburn	106	61	80.1	0.00
Mount Huachuca	0	0	0	0.55	Bakersfield	106	71	88.3	0.00
New River	100	54	70.7	T.	Barstow	105	56	81.4	0.00
Pantano	102	70	83.1	1.14	Beaumont	97	55	72.0	0.00
San Carlos	110	54	84.5	0.06	Benicia Barracks	90	51	66.7	T.
San Simon	102	60	79.8	T.	Berendo	106	68	83.2	0.00
Signal	107	60	84.0	0.06	Berkeley	78	51	60.7	0.06
Strawberry	0	0	0	0.20	Bishop Creek	105	70	88.8	0.00
Tevison	0	0	0	3.80					
Texas Hill	113	72	91.4	0.00					

Meteorological record of voluntary observers, &c.—Continued.

Stations.	Temperature. (Fahrenheit.)			Precip'n.	Stations.	Temperature. (Fahrenheit.)			Precip'n.
	Max.	Min.	Mean			Max.	Min.	Mean	
<i>California—Cont'd.</i>	0	0	0	<i>Ins.</i>	<i>California—Cont'd.</i>	0	0	0	<i>Ins.</i>
Borden	109	60	80.0	0.00	Sacramento (2)*	89	56	73.1	0.23
Boulder Creek	90	50	67.5	0.00	Salinas (1)* d.	75	51	60.4	0.00
Brentwood	94	65	77.5	0.13	Salinas (2)*	71	54	60.1	0.00
Brighton	100	58	75.8	0.22	Salton*	113	74	92.5	0.00
Byron	96	64	78.6	0.12	Sanger Junction	109	63	86.4	0.00
Cactus	115	68	91.8	0.00	San Ardo	98	54	67.6	0.00
Caliente	105	64	82.7	0.00	San Diego B'ks	74	57	64.9	0.15
Calistoga	98	50	66.9	0.00	San Fernando	96	48	67.9	0.00
Castroville	71	54	61.2	0.05	San Gabriel*	90	60	71.1	0.00
Centerville	93	58	68.9	0.01	San Jose	85	56	66.2	0.04
Chico	106	60	82.6	0.42	San Luis Obispo	92	49	64.2	0.00
Cisco	77	44	63.4	0.47	San Mateo	79	55	63.9	0.00
Colegrove				0.00	San Miguel	96	55	68.5	0.00
Coles	98	45	68.7	0.10	Santa Ana	88	60	72.1	0.00
Colfax	94	56	75.1	0.25	Santa Barbara (1)	74	50	62.5	0.13
Colton	102	60	72.3	0.00	Santa Barbara (2)*	76	60	66.9	0.00
Corning	108	47	84.6	0.65	Santa Clara	85	52	66.3	0.01
Crescent City				0.72	Santa Cruz	87	55	63.6	0.00
Davisville	99	58	71.6	0.34	Santa Margarita	95	50	71.9	0.00
Delano	105	63	86.8	0.00	Santa Maria	86	50	67.0	0.05
Delta	102	58	77.1	1.07	Santa Monica	82	60	68.9	0.00
Downey	84	60	69.3	0.00	Santa Paula*	82	58	68.4	0.00
Dunnigan	91	63	76.2	0.28	Santa Rosa*	88	52	65.4	0.25
Dunsmuir	106	45	67.6	1.12	Seven Palms	111	75	93.0	0.00
Edgewood	94	51	67.5	0.11	Shingle Springs	98	57	74.6	0.00
El Dorado	98	59	80.5	0.12	Sims	109	55	76.7	2.73
Elmira	100	60	73.1	0.15	Sisson	89	50	68.8	0.00
El Verano	87	52	64.4	0.17	Soledad	84	50	63.0	0.00
Emigrant Gap	84	44	63.9	0.38	Soquel	82	60	68.2	0.00
Esperanza	102	60	80.8	0.18	South Side	99	50	69.6	0.00
Evergreen				0.01	South Vallejo*	75	50	59.5	0.00
Farmington	101	62	76.6	0.01	Spadra	92	56	69.4	0.00
Felton	95	55	68.0	0.00	Steeles	79	48	63.2	0.00
Florence	82	58	68.9	0.00	Stockton (1)*	92	60	70.9	0.00
Folsom	100	62	77.6	0.23	Summit	76	38	61.1	0.22
Fort Bidwell	93	43	68.3	0.78	Suisun	95	58	69.3	0.00
Fort Gaston	101	36	67.4	0.04	Susanville†	94	51	74.1	1.55
Fort Mason	76	50	60.1	0.02	Tehachapi	94	54	78.3	0.00
Fresno	106	62	86.3	0.00	Tehama	102	65	79.0	0.95
Fruto	106	60	84.7	0.40	Templeton	98	55	67.8	0.00
Galt	96	62	75.3	0.08	Towles	90	54	73.9	0.00
Georgetown†	89	48	69.2	0.25	Tracy	103	62	78.6	0.00
Gilroy	92	50	67.1	0.00	Traver	102	68	85.8	0.00
Girard	95	58	75.9	0.00	Tropico	88	57	67.9	0.00
Glen Ellen	93	48	64.6	0.16	Truckee	90	46	70.5	0.00
Goshen	107	71	90.7	0.00	Tulare	105	64	85.3	0.00
Grass Valley				0.40	Turlock	103	63	79.6	T.
Hollister	78	50	61.7	0.00	Vacaville (1)*	98	58	72.5	0.20
Hornbrook	106	57	75.8	0.00	Vacaville (2)*	95	60	73.8	0.15
Hydesville†	75	40	57.8	0.40	Valley Springs*	99	59	78.9	0.07
Indio	108	70	88.7	0.00	Vina	107	60	80.8	0.50
Ione	98	54	73.9	?	Volcano Springs*	120	70	92.9	0.00
Iowa Hill	93	56	74.3	0.22	Walla Walla Creek*	94	39	66.9	0.19
Jolon				0.00	Westley	99	63	82.0	T.
Keeler	95	65	80.1	0.01	Wheatland	98	52	73.8	0.32
Keene	96	60	76.5	0.00	Whittier	91	59	71.2	0.00
Kingsburgh	105	60	85.8	0.00	Williams	106	60	84.8	0.05
King City	105	40	62.7	0.00	Willow (1)	105	53	78.7	1.30
Knight's Landing	95	50	68.3	0.41	Willow (2)*	104	47	80.3	0.30
La Grange	106	56	79.6	T.	Winters	103	67	82.6	0.15
Lathrop	100	44	69.2	0.00	Woodland*	98	56	72.1	0.35
Laurel	91	53	66.1	0.00	Walnut Creek*	98	50	68.1	0.05
Lemoore	105	64	84.4	0.00	<i>Canada.</i>				
Lewis Creek	104	64	84.0	0.05	McGill Col. Obser-	85	46	64.5	4.73
Livermore	92	50	64.9	T.	vatory, Montreal.				
Livingstone†	102	58	80.2	0.00	<i>Colorado.</i>				
Long Beach	82	62	68.3	0.00	Agate			59.2	
Los Angeles	90	58	69.2	0.00	Alma	72	23	48.8	0.76
Los Banos	100	62	76.9	T.	Aspen			50.7	
Los Gatos	92	58	71.1	0.00	Bennet*	112	45	66.2	1.80
Mammoth Tank	110	67	90.3	0.00	Breckenridge	85	8	48.6	1.47
Marysville	100	60	82.1	0.50	Byers			70.3	
Menlo Park	85	54	66.4	0.00	Canon City	94	42	70.0	0.67
Merced	100	56	78.2	0.00	Cheyenne Wells			66.0	5.10
Modesto	97	56	75.2	0.00	Climax			44.2	1.43
Mojave	100	62	82.7	0.00	Coulter*	81	28	52.5	1.16
Montague	102	64	82.9	0.60	Deer Trail			63.6	
Monterey	78	59	64.7	0.00	Delta*	54	69	0.00	
Monterey (Hotel del Monte)	84	46	65.5	0.00	Denver (Jesuit Col)	95	37	65.9	1.30
Mount Hamilton	98	51	67.4	0.05	Durango†				1.30
Napa	97	56	68.3	0.00	Eagle Farm				1.13
Newark	86	55	68.9	0.02	First View			65.8	2.92
Newhall	95	50	67.7	0.00	Fort Collins	90	35	62.3	2.16
Newman	104	60	80.1	0.00	Fort Crawford	99	33	65.2	0.38
Niles	87	56	68.7	0.00	Fort Lewis	82	30	59.1	0.60
Oakland (1)	78	55	61.3	0.07	Fort Logan	96	43	65.8	1.05
Oakland (2)*	78	54	61.9	0.00	Fort Lyon	102	39	69.0	1.41
Ontario	85	60	69.8	0.00	Fraser*	74	34	54.8	1.26
Orland	105	58	86.1	0.38	Georgetown	78	24	53.9	1.50
Oroville	96	60	79.0	0.42	Grand Lake*	86	33	63.5	1.32
Pajaro	72	56	62.6	0.00	Greeley	92	36	56.4	3.18
Palmdale	103	59	81.7	0.00	Gunnison			55.8	0.16
Paso Robles*	100	52	67.4	0.00	Hugo			68.8	
Petaluma	89	52	65.3	0.18	Husted	94	33	61.6	1.63
Pacerville	95	60	76.2	0.12	Idaho Springs		30	56.8	1.28
Pomona	92	63	72.0	0.00	Julesburg	94	43	66.6	3.90
Porterville	110	70	87.9	T.	Kit Carson			65.9	
Presidio of San F.	68	47	56.8	0.00	Lamar				2.56
Puerto	92	60	69.9	0.00	Leadville	72	19	48.0	0.66
Red Bluff	105	59	82.4	0.62	Livermore				4.08
Redding	108	55	81.7	0.96	Longmont†	96	36	62.3	1.68
Rocklin	104	58	78.1	0.25	Magnolia			71.5	
Rumsey	112	60	82.0	0.15	Monte Vista	91	23	58.2	0.62
Sacramento (1)	90	47	67.8	0.28	Palmer Lake		16		2.57
					Paoli			67.1	3.55